

AUG 21 2006

Application No. 10/628,373  
Amendment dated August 21, 2006  
After Final Office Action of May 25, 2006

Docket No.: 20435-00141-US

**BEST AVAILABLE COPY****REMARKS**

Applicants would like to thank Examiner Berman for withdrawing the objections to claim 1 and the rejections of claims 24-26 under 35 U.S.C. § 112, second paragraph. Applicant note that claims 1 and 46 were amended to clarify claim language. Claims 1, 46 and 51 were amended to include the limitations of canceled claim 36. In addition, claims 37, 39 and 42 have only been amended to depend from claim 1 in order to place the claims in proper format. Accordingly, Applicants respectfully request that the Examiner enter the amendments since all current claims have already been examined on the merits.

The rejection of claims 1, 3-9, 11-48 and 50-58 under 35 U.S.C § 103(a) over the combination of Ostlie (U.S. 5,876,805) and Moy (U.S. 5,945,489) is respectfully traversed.

Ostlie describes a visible light cured polymerizable thiol-ene composition. The composition requires free-radically polymerizable ethylenically unsaturated groups, a compound having a plurality of thiol groups and at least one acyl phosphine oxide photoinitiator. Applicants note that the free-radically polymerizable ethylenically unsaturated groups are required to contain both a vinyl monomer and an acrylate monomer (see examples in Table 1 and claim 1). Applicants also note that Ostlie recites useful ethylenically unsaturated acrylic species that does not include a Michael addition product (see column 3, lines 43-65). Finally, Applicants note that Ostlie does not teach or suggest an acidifying agent.

Moy describes liquid oligomer compositions containing unsaturation. The compositions are made by Michael addition reactions. Moy found that the crosslinked products of the compositions have similar properties with or without added photoinitiator. Applicants note that these specific studies were carried out to demonstrate that the compositions in Moy do not require photoinitiator. The studies were conducted because these results could not have been predicted and experimentation was required to demonstrate this effect. Applicants note that this result is specific to the composition described in Moy and the ability to eliminate photoinitiator with other types of compositions with various monomeric components is not predictable and

Application No. 10/628,373  
Amendment dated August 21, 2006  
After Final Office Action of May 25, 2006

Docket No.: 20435-00141-US

must be determined for each specific composition with multiple monomeric components. Finally, Applicants note that Moy does not teach or suggest an acidifying agent.

In order to establish a case of obviousness, the Office must meet three basic criteria. First, there must be some suggestion or motivation to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the references must teach all the claim limitations (MPEP § 2143).

The present disclosure involves a liquid oligomeric composition comprising a multifunctional mercaptan, an acidifying agent and a Michael addition product where the Michael addition product comprises a multifunctional acrylate Michael acceptor and a  $\beta$ -dicarbonyl Michael donor.

As noted above, Ostlie and Moy do not teach or suggest an acidifying agent; and therefore, a combination of these references does not contain all the limitations of the present disclosure. For this reason alone, the present disclosure would not have been obvious over the combination of Ostlie and Moy; and accordingly, Applicants respectfully request that the Office withdraw the rejection of the claims under 35 U.S.C. § 103(a).

In addition, Applicants note that a direct combination of Ostlie and Moy would give a composition containing a mercaptan, a Michael addition product (as the acrylate in Moy), a vinyl monomer and an acyl phosphine oxide photoinitiator. The present disclosure does not exclude a vinyl monomer or an acyl phosphine oxide photoinitiator; however, the effect of an acyl phosphine oxide photoinitiator on a composition containing a Michael addition product is unknown due to the unpredictability of polymer chemistry. This unpredictability could mean that the effect of this particular photoinitiator could be beneficial or deleterious to a product formed from a composition containing a Michael addition product. In any event, there would be no motivation to necessarily include this particular photoinitiator in the present disclosure. In addition, as discussed below, there would be no motivation to exclude the photoinitiator from the composition described in Ostlie as proposed by the Office.

Application No. 10/628,373  
Amendment dated August 21, 2006  
After Final Office Action of May 25, 2006

Docket No.: 20435-00141-US

The Office concludes that one skilled in the art would be motivated to modify Ostlie by replacing the vinyl and acrylate species cited in Ostlie with the Michael addition product of Moy because the acyl phosphine oxide photoinitiator required in the Ostlie could be eliminated. The modification to Ostlie proposed by the Office would require removing the vinyl monomer component in addition to the acyl phosphine oxide photoinitiator. This proposed modification removes two of four required components in the composition described in Ostlie.

The Office has made two conclusions that simply are not supported by the record.

First, the Office assumes that any multi-monomer composition containing a Michael addition component would be self-photoinitiating. The record (Moy) only supports the conclusion that a composition only containing a Michael addition product can photo-polymerize without a photoinitiator. As noted above, this result was not predictable and was only demonstrated by careful experimentation by Moy. The Office has assumed, with no other evidence, that any multi-monomer composition containing a Michael addition monomer will self-photoinitiate with all the other types of monomer in the composition. There is no evidence on the record to reasonably support this conclusion. Based on this type of analysis, one skilled in the art might reasonably conclude that Michael addition components will self-photoinitiate in such a way that only the Michael addition monomer will polymerize to the exclusion of other monomers (e.g., mercaptans). This effect would only give only a polymer of the Michael addition product no matter what other monomers are present.

Second, the Office assumes it is desirable to remove photo-initiator in all cases (e.g., multiple monomer compositions). This conclusion is not supported by the record. Photoinitiators can affect the polymerization process, and accordingly, there is no motivation to remove a component that is clearly required for the polymerization process as described in Ostlie. The composition in Ostlie contains three different monomer components. It may be more reasonable to conclude that the photoinitiator is required in Ostlie so that the three dissimilar monomers react in such a way as to give the desired product. Again, polymer

Application No. 10/628,373  
Amendment dated August 21, 2006  
After Final Office Action of May 25, 2006

Docket No.: 20435-00141-US

chemistry is not so predictable that experimentation can be eliminated. There is no way to determine from the record that such a modification of Ostlie would reasonably be successful.

Accordingly, there is no reason to believe that removing the photoinitiator in Ostlie would have been successful or would have been desirable. Therefore, there is no motivation to modify or combine the references as the Office has suggested, and for this reason alone, the present claims would not have been obvious over Ostlie and Moy (MPEP § 2143.01 (I, III and IV)).

Additionally, Applicants note that a reasonable expectation of success must be determined at the time the invention was made (MPEP § 2143.02). At the time the invention was made, Moy had demonstrated Michael addition monomers alone can self-photoinitiate and this was determined by experimentation. There is no evidence on the record, other than the present disclosure, that Michael addition monomers can polymerize with other types of monomers without photoinitiator. Given the unpredictability of polymer chemistry at the time the invention was made, there is no reasonable expectation that Michael addition monomers would photo-polymerize with another type of monomer in the absence of a photoinitiator. Applicants note that the present disclosure utilizes mercaptans and provides no evidence that Michael addition monomers will react with the vinyl monomers required in Ostlie in the absence of a photoinitiator.

Applicants also note that the proposed modification cannot render the reference unsatisfactory for its intended purpose (MPEP § 2143.01 (V)). As noted above, the proposed modification to Ostlie removes two required components including the vinyl monomer and the acyl phosphine oxide photoinitiator. Although polymer chemistry can be unpredictable, it is reasonable to conclude that elimination of two (out of four) essential components would render the composition in Ostlie unsatisfactory for its intended purpose. The vinyl monomer component may provide important properties to the composition and the photoinitiator may provide the proper reaction sequences with the various monomers to arrive at the required properties. Therefore, Applicants submit that the proposed modification to Ostlie may render the

Application No. 10/628,373  
Amendment dated August 21, 2006  
After Final Office Action of May 25, 2006

Docket No.: 20435-00141-US

composition in Ostlie unsatisfactory for its intended purpose. Therefore, the present claims would not have been obvious over the cited references on this basis.

Applicants note that the choice of an acrylate containing species would be difficult owing to the thousands of possible choices available. Ostlie generically describes ethylenically unsaturated compounds and provides examples of several species of acrylates that are preferred. However, Ostlie does not teach or suggest a Michael addition monomer as one possible species. Since there is no motivation to necessarily remove photoinitiator in Ostlie, there is no motivation found in Ostlie to select the Michael addition species described in Moy. Based on the present disclosure, it would simply be obvious to try and modify Ostlie by eliminating the acrylate and vinyl monomers and replace them with a Michael addition product (MPEP § 2154 (X)(B)).

Finally, Applicants note that Ostlie teaches away from the present claims. Ostlie requires both a vinyl monomer and a photoinitiator not necessarily required by the present disclosure. Ostlie notes the importance of the vinyl monomer (column 3, lines 36-41, examples and claims) and discusses the importance of the role of the acyl phosphine oxide photoinitiator in combination with other initiators (column 4, line 20 to column 5, line 23). These teachings lead away from the claimed composition which does not necessarily require these components that are essential to Ostlie (MPEP 2145 (X)(D)(1)).

Overall, a combination of Ostlie and Moy do not teach or suggest all the claim limitations of the present disclosure. In addition, there is no motivation to modify or combine the cited references and there is no reasonable expectation that the proposed modifications would have been successful. In addition, the proposed modifications to Ostlie may render Ostlie unsatisfactory for its intended purpose and Ostlie teaches away from the present disclosure. Therefore, the present claims would not have been obvious over the cited references; and accordingly, Applicants respectfully request that the Examiner withdraw the rejection.

In light of the discussion above, Applicants submit that the present claims are now in condition for allowance. In the event that an interview might serve to advance the prosecution of

Application No. 10/628,373  
Amendment dated August 21, 2006  
After Final Office Action of May 25, 2006

Docket No.: 20435-00141-US

the application in any way, the undersigned attorney is available at the telephone number noted below.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 22-0185, under Order No. 20435-00141-US from which the undersigned is authorized to draw.

Dated: August 21, 2006

Respectfully submitted,

By 

Donald K. Drummond, Ph.D.

Registration No.: 52,834

CONNOLLY BOVE LODGE & HUTZ LLP

1990 M Street, N.W., Suite 800

Washington, DC 20036

(202) 331-7111

(202) 293-6229 (Fax)

Attorney for Applicant

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

☐ BLACK BORDERS

☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES

☒ FADED TEXT OR DRAWING

☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING

☐ SKEWED/SLANTED IMAGES

☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS

☐ GRAY SCALE DOCUMENTS

☐ LINES OR MARKS ON ORIGINAL DOCUMENT

☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY

☐ OTHER: \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**